

Progress in Chinese and Western medicine Research on Threatened Abortion

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Abstract: *Threatened abortion is a frequent and common disease of pregnancy. In recent years, due to the influence of various factors, the incidence of Threatened abortion is increasing year by year, which seriously affects women's physical and mental health. Chinese medicine and western medicine have their own advantages and shortcomings in the treatment of this disease, now the Chinese and western medicine treatment of this disease is summarised as follows.*

Keywords: Threatened abortion, Chinese medicine treatment, Western medicine treatment, Research progress.

1. Introduction

Threatened abortion refers to the appearance of a small amount of vaginal bleeding before 28 weeks of gestation, often dark red or bloody leucorrhoea, but no pregnancy discharge, followed by paroxysmal lower abdominal pain or low back pain. Gynaecological examination showed that the cervix was not open, the membranes were not ruptured, and the size of the uterus was consistent with the number of weeks of menopause. The patient's symptoms disappear after rest and treatment, and the pregnancy may continue. If the vaginal bleeding increases or the lower abdominal pain worsens, the pregnancy develops into an inevitable miscarriage [1]. Studies have shown that 25% of women experience vaginal bleeding in early pregnancy, and half of them eventually develop miscarriage [2]. In recent years, with the increasing pressure of women's life and work, delayed childbearing age, and environmental and dietary changes, the incidence of Threatened abortion has been increasing year by year. According to incomplete statistics [3], the incidence of Threatened abortion in China is about 20%-25%. The etiological factors leading to Threatened abortion are complex and have not been fully studied. As far as we can see, the occurrence of Threatened abortion may be related to embryonic factors, female endocrine disorders, immune disorders, and coagulation abnormalities. Among them, luteal insufficiency caused by hormonal disorders is the main reason. Early supplementation of progesterone is an effective way of treating Threatened abortion, but the efficacy of simple western medicine is not good, and the combination of traditional Chinese and western medicine provides a new way of thinking and method of preserving the foetus.

Traditional Chinese medicine is based on the whole, emphasising on evidence-based treatment, and believes that the origin of Threatened abortion is in the kidney, and the pathogenesis of Threatened abortion is the lack of solidity of the kidney. The treatment is based on tonifying the internal organs, or tonifying the spleen and kidney, or tonifying Qi and blood, or nourishing and activating blood, or regulating blood and clearing heat, to achieve the efficacy of treating the disease and stabilising the foetus at the same time [4].

2. Chinese Medicine's Understanding of Threatened Abortion

The development of Chinese medicine has a long history, in the long process of the development of Chinese medicine, although there is no clear mention of the name of the disease of Threatened abortion, but according to the clinical manifestations can be classified as foetal leakage, foetal restlessness category. As early as in the JIN GUI YAO LVE, there is the elaboration of pregnancy bleeding due to the symptoms. However, the earliest clear record of foetal leakage, foetal restlessness is found in the "JING MAI", "Zhu Bing Yuan Hou Lun" two books. Due to the limitations of the times, there was no specific difference between the two despite their names. It was not until the Ming Dynasty "Ji Yin Gang Mu" that it was pointed out that fetal restlessness and fetal leakage both have bleeding, while fetal restlessness is accompanied by abdominal pain, and fetal leakage does not have abdominal pain. "If there is pain in the heart and abdomen and blood is shed in pregnancy, it is foetal movement. If there is no pain and blood is shed, it is foetal leakage." It was not until Ye Tianshi in the Qing Dynasty that it was clearly identified. Modern Chinese medicine has further materialised its definition and clinical manifestations. Fetal leakage is defined as a small amount of vaginal bleeding that comes and goes or drips continuously during pregnancy, not accompanied by lumbago, abdominal pain, and abdominal drop. If it is only lumbago, abdominal pain, and abdominal drop, with or without a small amount of vaginal bleeding, then it is called "foetal restlessness". Although there are differences in the clinical manifestations of these two, but with the later generations of medical doctors on foetal leakage, foetal restlessness of the understanding of the gradual deepening of its etiology and pathogenesis, treatment and regression of basic similar, so in the clinic is often discussed together.

2.1 Chinese Medicine Etiology and Mechanism

On its etiology and pathogenesis of the discussion, successive generations of medical doctors have their own opinions. Sui dynasty Chao Yuanfang [5] that the foetal movement

restlessness or due to overwork exhaustion, or due to improper diet, or due to living inappropriate, etc., the light can lead to rotating uneasiness, the heavier can lead to foetal meteoric injuries abortion, and put forward the mother's disease of foetal movement of the mother first treatment of its mother, the mother of foetal safety, foetal disease to the mother first review of the foetal cause, the treatment of foetal is the mother safe. Zhang Jingyue [6] of the Ming Dynasty pointed out that no matter fall, anger, weakness, fatigue, medicine, food, sexual life is not careful, the cause or false or real, or cold or heat, can lead to the occurrence of this disease. And further proposed that the cause of the disease should be clarified first in order to pre-cultivate its damage. Fu Shan [7] believed that qi deficiency does not regulate, the embryonic blood then sinks, the foetus is not contained as the main pathogenesis. Subsequent generations of medical doctors in the ancient sage theory, combined with their own clinical experience and the generation of play.

2.1.1 Deficiency of spleen and kidney

"People begin to be born, first become essence", women around 14 years old women around 14 years old, with the fullness of the essence in the kidney, the deca gradually mature, and through the role of the deca, contributing to the menstruation of the onset of menstruation, so there can be a child. A woman's conception depends on the adequacy of the kidney essence and the fullness of the deca, if the innate essence is insufficient, then the deca is not full, the menstruation can not be full on time, menstrual disorders, can not be conceived, or even after conception of the foetus is not solid. The spleen is responsible for transporting and transmitting essence, and is the source of qi and blood in the latter day. If the spleen qi is strong, the qi and blood of the five organs are sufficient, and the substances required for the development of the fetus are abundant, the fetus will be healthy and solid. However, "the spleen can not be transformed without the innate qi, and the kidney can not be born without the innate qi", the spleen and kidney nourish each other, the innate can be filled, the innate can be nourished, the kidney qi is vigorous, the spleen is strong, the mother is strong and healthy foetus is solid. Fu Qingzhu believed that although the twins are related to the belt vein, but "really about the spleen and kidney", modern Professor Zhao Ruihua [8] put forward the treatment of Threatened abortion from the theory of the belt vein, claiming that the origin of the belt vein is in the innate and complementary to the innate, the spleen and kidney deficiency leads to the loss of control of the belt vein and the development of the disease, in order to replenish the spleen and benefit the kidneys, treatment of the belt and foetus as the core of the treatment rules. Modern Professor Cai Shengzhao [9] believes that foetal movement is caused by kidney deficiency, and the lack of solidity of the Chong Ren makes the foetus lose its system of nourishment, which is often treated by tonifying the kidney, strengthening the spleen, and regulating the Chong Ren. Professor Ha Litian [10] has a similar viewpoint, stressing that the kidney does not carry the foetus, and the spleen's failure to take care of the foetus is the key to its pathogenesis. Ling Na [11] found that the proportion of patients with kidney deficiency was extremely high in 198 cases of early Threatened abortion through the investigation of physical factors.

2.1.2 Weakness of qi and blood

As the saying goes, "if qi and blood are abundant, the foetus will be at ease", the abundance of maternal qi and blood is the material foundation necessary for the growth and development of the foetus, and the normal growth and development of the foetus in the uterus depend on the mother's qi to be fixed, and the mother's yin and blood to be nourished. However, "women's life, there is more than enough in the qi, not enough in the blood", contemporary women in the family and social status is constantly improving at the same time, but also take on more responsibilities, too much labour, labour is too much, labour is consumed qi. Qi for the blood commander, blood comes from qi, whether it is insufficient generation of qi and blood, or qi and blood operation, will lead to the foetus loss of nourishment, foetal qi uneasiness. Zhang Jingyue believes that if the qi is deficient, it will not be fixed, and if the blood is deficient, it will not be irrigated. Blood and qi for the cultivation of the fetus of the book, blood and qi depletion, the fetus is no blood shade. Qi is not solid foetus, the embryo is certainly not safe and fall. Therefore, Fu Qing Lord foetus force advocate replenishment of qi to nourish blood, qi is strong enough blood, since there will be no leakage of foetus.

2.1.3 Blood stasis

As the Nei Jing says, "When there is a fall, the bad blood stays inside." This may be due to the mother's carelessness in caring for her body, or a fall, or overwork, or excessive labour, or the presence of a mass in the abdomen, which causes the mother's qi and blood to be out of balance, and the flow of qi and blood to be disorganized and stagnant and become evil, making it difficult to properly nourish the fetus and carry it to term, resulting in foetal restlessness, even miscarriage, or abortion. Women in modern society face pressure from work, family and society, which can easily lead to stagnation of qi, and stagnation of qi leads to blood stasis. In addition, as the incidence of embryonic foetal termination increases year by year, frequent abortions and induced abortions can also lead to blood stasis in the uterus due to impaired blood flow. With the retention of bad blood in the uterus and the mother's failure to recover from the aborted foetus, and with weak gestation and stagnation of qi, the embryo is bound to be unstable and there is a risk of miscarriage again. Professor Zhang Yingchun [12] believes that blood stasis is a non-negligible factor leading to foetal restlessness. The causes of blood stasis are as follows: first, the mother's blood and qi supply during pregnancy to support the twins, so that the yin and blood deficiency and yin deficiency and internal heat, yin depletion over time for stasis. Second, because of the women's more qi and more depressed, qi stagnation for blood stasis. Third, for the ordinary greedy cold, body yang deficiency, coupled with the external cold evil attack on the uterus, resulting in the cytosolic cold condensation and blood stasis. Fourth, for the external damage to the cytosolic blood, blood and blood and blood and blood and blood stasis. He Shi gynaecology [13] clinical evidence also focuses on the application of the method of nourishing and activating blood to stabilise the foetus. Zhang Li et al [14] found that patients with blood stasis had the highest proportion of miscarriages, which often manifested as repeated pregnancies and repeated abortions, depletion of qi and injury to blood.

2.1.4 Haemorrhagic fever

Zhang Jingyue said: "Fetal fever....., abortion in the internal heat and the virtual", clearly mentioning that blood heat is a major factor leading to fetal restlessness. With the change of life rhythm and dietary habits in modern society, blood-heat type of foetal restlessness is also common in clinical practice. On the one hand, due to work pressure, family pressure and other reasons lead to emotional imbalance, depression and fire, coupled with the essence and blood under the collection of fetal nourishment so that the yin and blood is weak, yang is overactive, and generate internal heat, heat disturbing the impulsive period of the fetus will be disturbed. On the other hand, due to gluttony and spicy stimulation of the products, the addiction to fat, sweet and thick flavour, resulting in the body's endowment of dampness, gathering for a long time to turn into hot, hot blood forced by the blood to travel to the sea of blood is not solid, the fetus is lost to the support of fetal restlessness. [15]. As the "blood evidence theory" said: "foetal leakage, the blood is blood heat, so the blood is forced to move.

2.2 Progress of Chinese Medicine Treatment

2.2.1 Chinese medicine treatment

Compared with Western medical treatment, Chinese medicine for restraining the fetus has gradually entered the patients' field of vision due to its unique advantages such as personalised diagnosis and treatment, fewer adverse reactions, high safety, and excellent effect in preserving the fetus. On the basis of following the wisdom of ancient sages, medical practitioners have played with ingenuity in the treatment of foetal restlessness, which is often as effective as a rafter.

Shou Tai Pill, created by Mr Zhang Xichun in the Qing Dynasty, has been tested by the hands of successive generations of medical practitioners and confirmed to be effective in treating foetal restlessness due to deficiency of the spleen and kidneys. After summarising and reviewing the literature on Chinese herbal medicines for tranquilising the foetus [16], it was found that the prescriptions for treating foetal restlessness caused by deficiency of the spleen and kidneys had the composition of Shouyu Pill, and that *Cuscuta chinensis* and *Sangsang shengsheng* were strongly correlated with each other. According to online pharmacological studies, Shou Zi Wan can exert its therapeutic effects by acting on the targets of tyrosine protein kinase and 5-hydroxytryptamine transporter gene through active ingredients such as β -sitosterol and quercetin. Modern medical practitioners also use this as the base formula with additions and subtractions to tonify the spleen and kidneys to stabilise the foetus. Song's gynaecology Song Shihua [17] created the six methods of foetal restoration, divided into types of treatment, or strengthening the spleen and kidney, or clearing heat and nourishing yin, or benefiting qi and solidification of the Chong, etc. She advocated the importance of foetal restoration and stopping haematochezia, and flexibly used charcoal to stop bleeding and stabilise the foetus; and the wonderful use of Qi Jing medicines, and the good addition of the introduction of menstrual medicines in the foetal restoration formula, which has a very good therapeutic effect. She advocates monthly foetal care, and in the process of foetal

care, she pays attention to regulating the patient's emotions and moods, and helping to nourish the qi of the spleen and stomach with diet and grains. He's Gynaecology [18] Professor Ho Ka-lin founded the nine methods of tonifying the odd meridians, which are good at regulating the Chong-Ren meridians, emphasising on propagation and tonification, so as to make the Chong-vein abundant, the Ren-vein open, and the qi and blood regulated in order to tranquillise and nourish the foetus. Her clinical use of medicines, such as astragalus - tai zi ginseng to nourish qi and blood to settle the foetus, angelica -chuanxiong to nourish and activate blood to settle the foetus, and lotus root charcoal -xianhe cao to astringent and stop bleeding to settle the foetus, [19], has often achieved good results.

2.2.2 Other treatments

In recent years, the flourishing development of Chinese medicine speciality therapies has provided new ideas and methods for the treatment of foetus preservation. Guo Taipin et al [20] combined Lingguo Bafa, which implies time rhythm, with viscera regulating acupuncture for foetal preservation treatment, and found that it could regulate maternal estrogen and progesterone levels, and could also pacify the foetus by slowing down uterine contractions. However, the literature on acupuncture treatment for foetus preservation is small and has certain limitations, so clinical application of acupuncture treatment should be done with caution. Li Jingying et al [21], through auricular pressure bean treatment, and according to the law of ziwu flow injection time with the addition of conventional Chinese and Western medicines, can effectively improve the patient's renal deficiency constitution and reduce clinical symptoms. In addition, the five tones therapy of Chinese medicine can produce different effects on patients' internal organs and emotions through sound waves and field qualities to regulate qi and restore kidney qi, which can have the effect of calming the foetus. In addition, traditional Chinese medicine fumigation, acupoint plastering and acupoint burrowing can play a benign regulating role for patients with disturbed foetal movement, which can effectively alleviate patients' anxiety and improve the quality of sleep, and can be promoted and applied as adjunctive treatments for foetal preservation in the clinic.

3. Western Medicine's Understanding of Threatened Abortion

3.1 Pathogenesis in Western Medicine

3.1.1 Anatomical abnormalities

Repeated miscarriages due to anatomical abnormalities of the uterus have been reported to occur in about 16 per cent of women. Congenital uterine developmental anomalies, such as longitudinal uterine septum, unicornuate and stumpy uterus, among which longitudinal uterine septum is the most common, accounting for about 80% and more [22]. However, there are also Asherman syndrome, endometrial polyps, and cervical insufficiency due to acquired dysplasia or uterine manipulation, etc. These uterine injury diseases with different degrees of severity affect the internal environment of the uterine cavity, which is not conducive to the implantation of the embryo, and easily lead to infertility, and even if the

embryo is successfully implanted, the lack of blood supply to the uterine cavity may result in an unfavourable pregnancy outcome. Xue Zhifang et al [23] observed the complications and neonatal outcomes of 382 pregnant women with combined uterine fibroids during pregnancy and delivery and found that the probability of obstetric complications such as premature rupture of membranes and placenta previa was significantly greater in pregnant women with combined uterine fibroids than in the control group, which increased the rate of caesarean section. Ouyang et al [24] found that there is a close relationship between the size, number and type of uterine fibroids in pregnant women and the occurrence of Threatened abortion, and the risk factor of Threatened abortion increases exponentially when the fibroids are greater than 5cm.

3.1.2 Endocrine abnormalities

The key causative factor for the occurrence of Threatened abortion is maternal endocrine abnormality. According to research [25], the reduced secretion of progesterone caused by luteal insufficiency not only results in endometrial dysplasia, but also leads to the susceptibility of the embryo to the attack of the maternal immune system, which is often accompanied by uninhibited uterine contractions of the mother and an unfavourable outcome of the pregnancy. Patients with polycystic ovary syndrome have systemic endocrine disorders, sparse or anovulatory ovulation, accompanied by hyperandrogenic manifestations, which not only make conception difficult, but also most often lead to the occurrence of miscarriage due to poor follicular development and poor quality of the fertilised eggs formed, but the exact mechanism is still unclear [26]. A meta-analysis showed [27] that abnormalities in thyroid function during pregnancy increase the risk of adverse pregnancy outcomes such as miscarriage and placental abruption. Metabolic disorders and hormonal abnormalities caused by other endocrine diseases such as diabetes mellitus and hyperprolactinaemia may also have an impact on endometrial development and affect embryo implantation.

3.1.3 Immune abnormalities

Embryo implantation and growth and development in the uterus is a persistent foreign invasion to the maternal immune system, and only by suppressing maternal immune function and enabling the mother to build up immune tolerance can the embryo be successfully implanted and developed. Studies have shown [28] that immune system disorders such as systemic lupus erythematosus and antiphospholipid syndrome increase the risk of adverse pregnancy outcomes. Although the exact mechanism is still unknown, according to the known studies, it may be that it causes platelet aggregation and microthrombosis in the uterus and placenta, resulting in insufficient blood supply, and it has an inhibitory effect on the secretion of the syncytiotrophoblasts, which results in the poor secretion of hormones to maintain pregnancy, leading to an increased incidence of adverse pregnancies. The incidence of adverse pregnancies is increased. Chen Jinfeng et al [29] tested 127 pregnant women with Threatened abortion for antiphospholipid antibodies and found that antiphospholipid antibody-positive pregnant women had a higher index of uterine artery resistance and a higher risk of adverse

pregnancy outcomes. In addition, studies have shown [30] that abnormalities in immunoreactive cells such as T cells, macrophages, and natural killer cells at the maternal-fetal interface are associated with an imbalance in the maternal-fetal immune tolerance mechanism.

3.1.4 Abnormal coagulation function

In recent years, more and more studies have found that there is a close relationship between the pre-thrombotic state, i.e., thrombophilia, and Threatened abortion, especially recurrent miscarriage, which has attracted widespread attention, and its specific mechanism is still under further study [31]. According to the current domestic and international studies, the factors that cause women to be prone to thrombosis can be classified as congenital hereditary and acquired. In the former case, a pathological hypercoagulable state may occur due to activated protein C resistance, dysfunction of the anticoagulation and fibrinolytic systems caused by mutations in the thrombospondin gene and methylenetetrahydrofolate reductase (MTHFR), which affects the exchange of substances between the mother and the foetus, leading to foetal ischaemia and hypoxia. Studies have shown [32] that pregnant women in a hypercoagulable state may be positive for autoimmune antibodies, such as positive anticardiolipin antibodies. In addition, high levels of homocysteine in the blood are a risk factor for acquired thrombophilia, which may be associated with hyperhomocysteinemia due to the lack of factors that assist homocysteine metabolism, such as folic acid and vitamin B6, in the daily diet, which can affect the synthesis of various coagulation factors while damaging vascular endothelial cells, resulting in hypercoagulability of the blood of women during pregnancy [33].

3.1.5 Infectious factors

Invasion of alien species is a great challenge to both the mother and the foetus. Bacteria, viruses and fungi can infect the foetus either directly or indirectly through the placenta by upstream infections from the lower genital tract, leading to foetal malformations or miscarriage, including common viral infections such as herpesvirus, rubella virus, cytomegalovirus, and HIV, as well as pathogens such as mycoplasmas, chlamydia and other pathogenic infections [34]. According to a study [35], one-fifth of pregnant women who experienced Threatened abortion had been infected with *Toxoplasma gondii*. A clinical observation [36] showed that one of the causes of late Threatened abortion and preterm labour may be closely related to reproductive tract infections, with a detection rate of 70.97%, of which *Mycoplasma* is the most important source of infection.

3.1.6 Embryonic factors

The survival of the fittest. Human survival and reproduction is a continuous process of survival of the fittest, abortion is the natural selection of embryos, and fetal chromosomal abnormalities are the most common cause of early pregnancy loss, accounting for more than 2/3 of all 6-10 weeks early pregnancy loss. Li Lingling et al [37] found chromosomal abnormalities in 231 of 369 chorionic villus specimens tested, accounting for 62.60%, which is consistent with the results of previous studies. Li Xiaohua [38] performed chromosomal

testing on 240 aborted chorionic tissues from patients with embryonic arrest and found that the total detection rate of chromosomal abnormalities was 75.42%, according to the study [39], both numerical and structural abnormalities of chromosomes can lead to embryonic arrest, and the rate of chromosomal abnormalities of embryos in pregnant women of advanced age who have had multiple miscarriages will be significantly higher.

3.2 Western Medical Treatment

3.2.1 Hormone therapy

In the current treatment of luteal insufficiency Threatened abortion, effective foetal preservation can be achieved with progestogen supplementation. Synthetic progestins have been withdrawn from clinical use due to the possible increased risk of masculinisation of the female foetus, and among the natural progestins, dydrogesterone has been more widely used in the treatment of preeclamptic miscarriage. According to a study [40], dextroprogesterone has high selectivity for the progesterone receptor, with a bioavailability of 28% and rapid oral absorption, which enables effective supplementation of endogenous progesterone and promotes the development of the endometrium, providing conditions for embryo implantation and growth.

Progesterone, as one of the commonly used drugs for foetal preservation in clinical practice, can enter the mother's body through oral, intramuscular, vaginal natriuretic and other ways. According to research [41], oral progesterone is convenient, so the patient compliance is better, but the activity of oral drugs will be significantly reduced after hepatic metabolism, and the drug half-life is shorter, the bioavailability is less than 10%, and it is unable to maintain an effective concentration in the body. Intramuscular injection of progesterone is very good to avoid the first-pass effect of the liver, so that the body has enough blood concentration to maintain, preservation of the foetus better than oral, but because of the local use, can lead to the patient's skin redness, swelling, hardness, ulcers and other discomforts, and the patient can not be self-administered, so the adherence is poorer. Vaginal natriuretic progesterone, as a kind of targeted drug delivery, can act directly on the uterus, reducing the loss of drug due to systemic absorption, with better therapeutic effect, but the shortcoming is that vaginal drug delivery will stimulate the increase of vaginal secretion, causing itching, bleeding and other discomforts, and it is more difficult to use by patients, which limits the popularity of vaginal natriuretic drugs to a certain extent.

Human chorionic gonadotropin, which can be extracted from the urine of pregnant women, is a peptide hormone synthesised by the placenta, and as far as theory is concerned, hcg stimulates the corpus luteum to continuously secrete oestrogen and progesterone, which in turn plays a role in the preservation of the pregnancy. Wang Anne et al [42] divided 9640 patients with Threatened abortion into hcg use group and progesterone group, and there were 3455 patients with successful pregnancy up to 20 weeks, accounting for 35.4%, of which the pregnancy success rate of the progesterone group was 40.04%, which was significantly higher than that of the hcg use group of 22.41%, which indicated that the

effectiveness of progesterone was stronger than that of hcg. However, the follow-up neonatal data showed that the malformation rate in the hcg group was lower than that in the progesterone group, and it was considered that the higher rate of fertility preservation with progesterone may have resulted in the malformed foetus being preserved until delivery because of the drug. However, there are still no authoritative guidelines recommending the use of hcg in the treatment of clinical Threatened abortion, and there is insufficient evidence that the outcome of pregnancy after hcg treatment in early pregnancy is as expected, and its effectiveness is still doubtful.

3.2.2 Anticoagulation

Numerous studies have shown that patients with Threatened abortion can be found to have a fluid dark area around the gestational sac on ultrasonography, which is considered to be a haematoma formed when the chorionic villous membrane separates from the endometrium to form a cavity due to bleeding, and blood accumulates in it, with an incidence of up to 4%-48% [43]. If the patient is older, the haematoma is larger in size and is detected earlier in the gestational week it is more likely to lead to adverse pregnancy outcomes. In recent years, research on subchorionic haematoma has been in full swing and anticoagulation has received much attention in the treatment of fertility preservation. Evidence-based studies have shown [44] that low molecular heparin is safe to use for anticoagulation in pregnancy, and adverse effects are unknown. According to a Meta-analysis of different types of low molecular heparin [45], Trinz and naltrexone were more effective in combating recurrent miscarriage. Zhang Miaomiao [46] treated 38 patients with advanced Threatened abortion in combination with enoxaparin sodium on the basis of resorcinol, and found that the combination of the two could effectively alleviate the clinical symptoms of the patients, with a shorter time of alleviation and higher endocrine and coagulation indexes than the single application of resorcinol, while the incidence of adverse pregnancy outcomes was significantly lower.

4. Summary

In summary, the incidence of Threatened abortion is increasing year by year, and the etiology is complex. Western medicine believes that it is mainly related to endocrine imbalance, and the treatment focuses on improving progesterone level, but its effectiveness and safety are still controversial, and the treatment method is single, lack of personalised treatment, and more adverse reactions. Traditional Chinese medicine is based on the Chong Ren, to regulate the internal organs as the method, and also to replenish qi, clear heat, remove blood stasis, etc., the use of individualised diagnosis and treatment, oral Chinese medicine can also be supplemented with Chinese medicine characteristics of the therapy, such as auricular acupoints, acupuncture, acupoint injections, etc., generally can make the clinical symptoms of Threatened abortion significantly relieved, and at the same time have a certain reduction of the patient's nervous anxiety, and then improve the success rate of pregnancy. However, as of now, the treatment of Threatened abortion with Chinese medicine is limited to clinical observation and pharmacological study of single Chinese

medicine for foetal protection, with less relevant experimental study and incomplete evidence of foetal protection theory. Therefore, the joint application of TCM evidence-based treatment and Western symptomatic treatment, which can complement each other and synergise with each other, is the innovation and development of foetal preservation treatment, and provides new ideas and methods for clinical foetal preservation treatment.

Fund Project

(1) Construction Project of Inheritance Studio of Liu Maolin, the national famous old Chinese medicine expert (Chinese Medicine Education Letter [2018] No.134).

(2) Construction Project of Regional Diagnosis and Treatment Center of Gynecology of Traditional Chinese Medicine in Shaanxi Province (Shaanxi Medicine Letter [2018] No. 268).

(3) Construction Project of Inheritance Work of Huo Liu's School of Gynecology in Yulin City (Shaanxi Traditional Chinese Medicine Letter [2018] No.337).

(4) Clinical study of Taibao Decoction in the treatment of threatened abortion with luteal insufficiency (SZY-NLTL-2022-027).

References

- [1] Xie H, Kong B, Duan T, et al. Obstetrics and gynaecology 9th edition [M]. Beijing: people's health press, 2018.07.
- [2] Kamaz AG, İnan AH, Beyan E, Budak A. The effects of threatened abortions on pregnancy outcomes. *Ginekol Pol.* 2019;90(4):195-200.
- [3] FAN Ming-Feng, HE Li-Ping, YU Ci-Bi, et al. Analysis of the Effect of Didroxyprogesterone in the Treatment of Threatened Abortion and Its Influence on the Success Rate of Pregnancy Protection[J]. *China Journal of Pharmaceutical Economics*, 2022, 17(07):76-79.
- [4] YANG Xinchun, WANG Shuyu, DU Huilan, et al.. Expert Consensus on Clinical Diseases Responding Specifically to Traditional Chinese Medicine: Threatened Abortion[J]. *Chinese Journal of Experimental Traditional Medical Formulae*, 2024, 30(07):241-246.
- [5] ZHUANG Shu-han, ZHOU Xuan, TIAN Zhi-kui, et al. Explanation of the etiology and pathogenesis of threatened abortion from Zhu Bing Yuan Hou Lun[J]. *Journal of Basic Chinese Medicine*, 2019, 25(10): 1354-1355.
- [6] Liu Yaqian, Zhou Ying. Inheritance and Development of Luo Shi Gynecology in Lingnan from the Academic Thoughts of Miscarriage Prevention in Furen Gui[J]. *Journal of Traditional Chinese Medicine*, 2020, 61(05):449-452.
- [7] SONG Ke, GAO Jia, ZHANG Yingdan, et al. Thoughts on pregnancy safety in "Fu Qingzhu's Obstetrics and Gynecology" [J]. *Clinical Journal of Traditional Chinese Medicine*, 2018, 30(11):1988-1990.
- [8] Li Tiantian, Zhao Ruihua. Exploration of Zhao Ruihua's thoughts on the treatment of foetal restlessness from the band pulse theory[J]. *Journal of Basic Chinese Medicine*, 2023, 29(12):2097-2100.
- [9] HU Kaili, FEI Aihua, LUO Xingzi, et al. CAI Shengchao's clinical experience in treating threatened abortion[J]. *China's Naturopathy*, 2021, 29(04):38-40.
- [10] ZHAO Minghui, ZHANG Jing, HA Hong, et al. Professor Ha Litian's experience in treating early Threatened abortion[J]. *Lishizhen Medicine and Materia Medica Research*, 2021, 32(05):1238-1239.
- [11] Ling Na. Physical Factors Investigation and Analysis of 198 Cases of Early Pregnancy[J]. *Liaoning Journal of Traditional Chinese Medicine*, 2016, 43(05):914-916.
- [12] AO Guo-jin, ZHANG Hua, ZHANG Ying-chun. ZHANG Ying-chun's Theory and Experiences of Treating Threatened Abortion with Method of Invigorate the Circulation of Blood[J]. *Journal of Basic Chinese Medicine*, 2021, 27(10):1661-1663.
- [13] GAO Tao, HE Jia-lin, ZHANG Qin, et al. Origin, inheritance and application of HES' gynecology school in miscarriage prevention by nourishing the blood and promoting blood circulation[J]. *China Journal of Traditional Chinese Medicine and Pharmacy*, 2020, 35(04):1675-1677.
- [14] ZHANG Li, JIANG Fenghua, GUAN Yingying, et al. Relationship between Serum HCG, P, E2 and TCM Syndrome Types of Early Threatened Abortion[J]. *Chinese Archives of Traditional Chinese Medicine*, 2023, 41(04):221-225.
- [15] Zheng Yaping, Kang Ning. Clinical experience of Professor Hu Yuchuan in treating renal deficiency and blood heat type of Threatened abortion[J]. *GUANGMING JOURNAL OF CHINESE MEDICINE*, 2024, 39(01):61-63.
- [16] YANG Liuqing, CHEN Yun, MU Chenyun, et al. Exploring the mechanism of action of Shoufu Pill for the treatment of Threatened abortion based on network pharmacology[J]. *Chinese Traditional Patent Medicine*, 2021, 43(03):809-815.
- [17] LU Yi, SONG Shi-hua. Medication experience of the SONGs' gynecology on fetal leakage and fetal irritability[J]. *China Journal of Traditional Chinese Medicine and Pharmacy*, 2021, 36(11):6543-6545.
- [18] HUANG Yun, BAO Xi, HE Jialin. Experience in treating pregnancy disease with dredging and tonifying the eight extra-channels[J]. *China Journal of Traditional Chinese Medicine and Pharmacy*, 2023, 38(12):5838-5841.
- [19] MA Jing, MA Yi-ming, HE Jia-lin. HE Jia-lin's experience on the treatment of difficult pregnancy diseases according to classics of traditional Chinese medicine[J]. *China Journal of Traditional Chinese Medicine and Pharmacy*, 2021, 36(06):3416-3418.
- [20] Guo Taipin, Li Weilin, Tai Xiantao, et al. A Preliminary Study on the Eight Methods of Intelligent Turtle Combined with the Qi Regulating Needle Technique of the Internal Organs for Preventing Miscarriages[J]. *Modernization of Traditional Chinese Medicine and Materia Medica-World Science and Technology*, 2021, 23(02):622-627.
- [21] LI Jing-ying, ZHOU Jian-ping. Clinical effect of midnight-noon ebb-flow of ear acupoint pressing bean on improving yang-deficiency constitution and clinical curative effect of early threatened abortion with

- kidney-deficiency syndrome[J]. Chinese Journal of General Practice, 2022, 20(03):478-481.
- [22] ZHANG Bing Ting, DUAN Run Zi, BAI Xin Jiu, et al. Research progress in the etiology of recurrent spontaneous abortion[J]. Chinese Journal of Women and Children Health, 2023, 14(06):72-76.
- [23] XUE Zhifang, WU Yueqin, WANG Xixian, et al. Complications, Pregnancy and Neonatal Outcome of Patients with Uterine Fibroids[J]. Medical Recapitulate, 2018, 24(22):4573-4576.
- [24] OUYANG Yanlan, ZENG Xiqun, HUANG Yanting, et al. Risk factors for the occurrence of early threatened abortion in pregnant women with uterine fibroids[J]. China Medicine And Pharmacy, 2021, 11(22):145-148.
- [25] Cai Si-Min. Clinical study on the combined treatment of kidney yin deficiency type early Threatened abortion with Chinese and western medicine [D]. Yunnan University of Traditional Chinese Medicine.2023.
- [26] Fei Y S, Jie Z, Ming Y X, et al. High BMI and Insulin Resistance Are Risk Factors for Spontaneous Abortion in Patients with Polycystic Ovary Syndrome Undergoing Assisted Reproductive Treatment: A Systematic Review and Meta-Analysis [J]. Frontiers in Endocrinology, 2020, 11 592495-592495.
- [27] Jorge V, Renata S, I M P, et al. Immune tolerance at the maternal-placental interface in healthy pregnancy and pre-eclampsia. [J]. The journal of obstetrics and gynaecology research, 2020, 46 (7): 1067-1076.
- [28] Mendes J, Areia AL, Rodrigues-Santos P, Santos-Rosa M, Mota-Pinto A. Innate Lymphoid Cells in Human Pregnancy. Front Immunol. 2020, 11:551707. Published 2020 Nov 30.
- [29] CHEN Jin-feng, ZHU Hai-yan, SHU Jing. Correlation analysis of uterine artery resistance, serum antiphospholipid antibody and pregnancy outcome in pregnant women with antiphospholipid antibody-positive threatened abortion[J]. Maternal and Child Health Care of China, 2024, 39(04):583-587.
- [30] TIAN Qin-jie. Progress of mechanisms of immune dysfunction and progesterone prevention in abortion[J]. Journal of Reproductive Medicine, 2020, 29(09):1125-1131.
- [31] PING Yunlu, ZHAO Xiaoxuan, FENG Xiaoling, et al. Research Progress of Traditional Chinese and Western Medicine in Treating Recurrent Abortion Caused by Prethrombotic State[J]. Acta Chinese Medicine and Pharmacology, 2020, 48(10):64-68.
- [32] Yang Huixuan, Fu Ping, Wang Sihui. Research Progress in Diagnosis and Treatment of Prethrombotic Status Related Recurrent Abortion[J]. Journal of Chengdu University of Traditional Chinese Medicine, 2020, 43(02):70-74.
- [33] Chen Dongya. Clinical controlled study on Chinese and western treatment of pre-thrombotic state tendency in recurrent abortion [D]. Zhejiang University of Traditional Chinese Medicine, 2023.
- [34] Liu Hongwei. Management of recurrent miscarriage due to infectious factors[J]. Journal of Practical Obstetrics and Gynecology, 2020, 36(11):813-814.
- [35] Valladares-Garrido MJ, Failoc-Rojas VE, Ichiro-Peralta C, Astudillo-Rueda D, Silva-Díaz H. Toxoplasma gondii Infection and Threatened Abortion in Women from Northern Peru. Infect Dis Obstet Gynecol. 2022;2022:1163655. Published 2022 Aug 8.
- [36] Walter K. Early Pregnancy Loss. JAMA. 2023, 329(16):1426.
- [37] LI Lingling, LIU Yuefang, PAN Qiong. Analysis and Clinical Significance of Chorionic Chromosome Results of 369 Patients with Early Embryo Abortion[J]. Smart Healthcare, 2023, 9(26):43-47.
- [38] LI Xiaohua, SHI Zijia, WANG Junxia, et al. Chromosome analysis of villus tissues in patients with embryo damage[J]. Shandong Medical Journal, 2023, 63(36):1-4.
- [39] Zhu Dan, Sun Luming. Progress in the study of genetic correlates of recurrent miscarriage[J]. Chinese Journal of Prenatal Diagnosis (Electronic Version), 2023, 15(04):68-74.
- [40] ZHANG Xiaoi, DU Fuqin, FANG Ju. Effects of Dydrogesterone tablets combined with routine pregnancy protection on the outcome of threatened abortion[J]. Acta Medicinæ Sinica, 2023, 36(06):33-37.
- [41] WANG Yue, CHENG Yi, LIU Yuan-bing, et al. Research progress on new dosage forms of progesterone and its preparation methods[J]. Acta Pharmaceutica Sinica, 2022, 57(02):353-363.
- [42] WANG An-ni, FENG Xin. Efficacy Safety and Economics of Human Chorionic Gonadotropin in the Treatment of Threatened Abortion[J]. Chinese Pharmaceutical Journal, 2021, 56(20):1649-1654.
- [43] WANG Xue-juan, JIAO Jun, MA Xiao-tian, et al. Analysis of risk factors for premature delivery and abortion in subchorionic hematoma[J]. Chinese Journal of Practical Gynecology and Obstetrics, 2023, 39(12):1237-1240.
- [44] ZHANG Chuan, ZHANG Li, LI Yongqin, et al. Safety of low-molecular-weight heparin in pregnancy: a systematic review[J]. Chinese Journal of Evidence-based Medicine, 2021, 21(11):1259-1268.
- [45] CHEN Linhua, MA Wanjun, WANG Wanyu. Efficacy and safety of different low-molecular-weight heparins in improving pregnancy outcomes in patients with recurrent abortion: a network meta-analysis[J]. Chinese Journal of Evidence-based Medicine, 2023, 23(07):790-796.
- [46] ZHANG Miaomiao. Effect of enoxaparin sodium combined with phloroglucinol in the treatment of patients with threatened abortion and its influences on E2, P and β -HCG levels[J]. Clinical Research and Practice, 2024, 9(01):137-140.